



# HF Happenings

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You can now download your copy of HF Happenings from [www.sarl.org.za/hf\\_happenings.asp](http://www.sarl.org.za/hf_happenings.asp).

## IARU Region 1 HF Band Plan

The new IARU Region 1 HF Band Plan comes into effect on 1 June 2016. Changes were made to the band plan during discussions at the Region 1 Interim Meeting held in Vienna in April 2016. The recommendations from this meeting were approved at the Region 1 EC meeting in Brussels in May and became interim Region 1 Policy until the General Conference in September 2017.

The two main items are the introduction of Digimode segment at 3 570 kHz - 3 580 kHz with a maximum bandwidth of 200 Hz and a digimode segment with maximum bandwidth of 500 Hz extended from 10 130 kHz to 10 150 kHz.

The band plan is available from the League web site at [www.sarl.org.za](http://www.sarl.org.za)

## 2016 IARU HF World Championship Contest

The 2016 IARU HF World Championship Contest takes place the second full weekend of July, beginning at 12:00 UTC Saturday and ending at 12:00 UTC Sunday (9 - 10 July 2016). Both Single and Multi operator stations may operate the entire 24-hour period.

All licensed amateurs worldwide are eligible to participate in this contest. The objective of this contest is to contact as many other amateurs as possible; especially IARU member society HQ stations, around the world using the 160, 80, 40, 20, 15 and 10 metre bands. Multipliers are the total number of ITU zones plus IARU member society HQ stations worked on each band (not mode). The participation of Society HQ stations is very important for the multipliers.

IARU officials represent a maximum of four multipliers per band (AC, R1, R2 and R3). The regional AC members have the option of using "AC" or their regional designator "R1," "R2" or "R3". Other regional EC members use their regional designator "R1," "R2" or "R3".

You can find the complete rules at [www.arrl.org/iaru-hf-championship](http://www.arrl.org/iaru-hf-championship)

## 1A0KM Pirate Activities

Sergio, IKOFTA, QSL Manager of 1A0KM (Sovereign Military Order of Malta), reports to all DX amateurs/community that all activities from the station 1A0KM are published in advance and are available on their QRZ.com page as well as in the major DX bulletins. Recently some stations have been PIRATING the 1A0KM call sign and have made a dozen QSOs.

Sergio states, [edited] "Please do not waste your time trying to work pirates and - over all - save your money and do not waste your time in sending QSL cards if the activity has not been published before hand on our QRZ.com page; I'm very sad to reply to many of you: 'sorry it was a pirate' ... so if you don't see our "publicly announcement" of activities on our QRZ.com page, consider those transmissions were made by pirates."

## 2016 Digital mode most needed DXCC entities survey results

Don, AA5AU, sent out the following announcement, "I am very happy to announce the results of the 2016 Digital Mode Most Needed DXCC Entities Survey. Thank you to all the digital



South African Radio League \* Suid-Afrikaanse Radioliga  
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operators who took part in the survey. It was a huge success. The survey had 716 participants and double the number entries compared to the last survey in 2011.

Also thanks to fellow team members Ed, WOYK, and Larry, K8UT, in helping conduct the survey. The survey home page is at <http://www.aa5au.com/rtty/digital-most-needed-dxcc-entities>. We hope you enjoy the survey." Don. AA5AU, Ed, WOYK, and Larry, K8UT

### Amateur radio 'like fishing'

The Chicago Tribune reports on the art, the science and the continuing fascination behind ham radio usage.



"Making a rare or difficult contact with someone or making something work that is a challenge. It's a good adrenaline rush, just like gaming," said Tim McGillen, N9CA, program chairman for the Lake County Amateur Radio Club.

McGillen likens amateur radio use to fishing, meaning you do not always know what or who you will catch.

"Just imagine catching the same eight-inch fish every time," he said. "After a while, it would get pretty boring. It would lose its challenge. The same goes with using a cell phone or Internet compared to using a amateur radio to reel in someone else. It is the challenge of it all.

Some of it is pure luck, some of it is pure science," he added. Read the full story at <http://www.chicagotribune.com/suburbs/post-tribune/opinion/ct-ptb-davich-ham-radio-operators-st-0523-20160522-story.html>

### CQ announces the 2016 Hall of Fame inductees

(Press Release, 20 May)

CQ magazine today announced its 2016 Hall of Fame inductees, 2 new inductees to the CQ Contest Hall of Fame and 21 new members of the CQ Amateur Radio Hall of Fame.

The CQ Amateur Radio Hall of Fame honours those individuals, whether licensed hams or not, who have made significant contributions to amateur radio and those amateurs who have made significant contributions either to amateur radio, to their professional careers or to some other aspect of life on our planet. The 2016 inductees (listed alphabetically) are:

Bob Arnold, N2JEU (SK) - Co-developer (with Keith Lamonica, W7DXX, see below) of the first internet-controlled remote base

Grant Bingeman, KM5RG (SK) - Developed "method of moments" antenna modelling software for AM broadcast stations and 160-metre amateur antennas

### May

- 1 - Worker's Day
- 2 - Public Holiday
- 5 - Ascension Day
- 7 and 8 - AWA Valve QSO Party
- 8 - Mother's Day; SARL Youth Net at 15:00 UTC on 7 070
- 15 - ZS3 Sprint
- 19 - Radio Amateur Examination
- 20 to 22 - SARL National Convention, Sasolburg
- 20 to 22 - Dayton Hamvention
- 23 - Closing date for June Radio ZS articles
- 25 - Africa Day
- 29 - SARL Digital Contest

### June

- 5 - World Environmental Day
- 6 - Start of Ramadan
- 8 - World Oceans Day
- 12 - Hammies ZS6 Sprint; SARL Youth Net
- 16 Youth Day
- 17 World QRP Day
- 19 Father's Day
- 20 Winter Solstice
- 21 closing date for July Radio ZS articles
- 23 to 27 - SARL Top Band QSO Party
- 24 to 26 - Ham Radio 2016, Friedrichshafen, Germany

Bob Carpenter, W3OTC (SK) - Pioneer of meteor scatter and FM stereo broadcast technology; a long time AMSAT volunteer

David Dary, W5ZAX - Journalist, author, journalism educator - former correspondent for CBS and NBC News, journalism professor at the University of Kansas and University of Oklahoma, author of over 20 books on the American West

Matt Ettus, N2MJI - Software defined radio pioneer; developed first Universal Software Radio Peripheral (USRP) with GNU radio software support

Terry Fox, WB4FJI - Packet radio pioneer; primary developer of AX.25 amateur packet protocol

Elmer "Bud" Frohardt, Jr., W9DY (SK) - The original "Elmer" for whom amateur radio mentors are named (courtesy of a 1971 QST "How's DX?" column by Rod Newkirk, W9BRD/VA3ZBB)

Fred Gissoni, K4JLX (SK) - Adaptive technology pioneer; co-developer of the Porta-Braille and Pocket-Braille note-taking devices for the visually impaired, as well as many other devices

Ken Kellerman, K2AOE - Radio astronomer; pioneer of radio interferometry; co-developer of very long baseline interferometry (VLBI), which permits multiple telescopes to function as a single instrument

Keith Lamonica, W7DXX - Co-developer (with the late Bob Arnold, N2JEU) of the first internet-controlled remote base

George Mitchell, K6ZE (SK) - Member of the Tuskegee Airmen in World War II and 2007 recipient of the Congressional Gold Medal for his wartime service

Les Mitchell, G3BHK (SK) - Founder of Jamboree on the Air (JOTA), annual event to introduce amateur radio to scouts and guides around the world

William Moerner, WN6I - Co-recipient of the 2014 Nobel Prize in chemistry for his work in high-resolution microscopy

Leigh Orf, KG4ULP - Co-developer of tornado simulator using computer modelling to simulate conditions under which tornadoes form

Joe Rudi, NK7U - Former Major League baseball player; 3-time All-Star

Wes Schum, W9DYV (SK) - Co-founder of Central Electronics, developed first commercially manufactured amateur radio SSB transmitter

Garry Shandling, ex-KQ6KA/KD6OY (SK) - Well-known comedian, actor, writer and television personality

Mason Southwirth, ex-W1VLH (SK) - Head of ARRL International Geophysical Year (IGY) Propagation Research Project in 1958-59; conducted additional propagation research at Stanford University

Boris Stepanov, RU3AX (ex-UW3AX) - Leading Russian amateur, deputy editor of Russian Radio magazine; pioneer of computerized contest logging and log-checking; developed prototype for World Radiosport Team Championships (WRTC); first to propose "glass cockpit" for amateur transceiver, combining frequency readout and spectrum scope on front panel display

Rufus Turner, W3LF (SK) - Believed to be the first African-American radio amateur in the U.S.; helped develop 1N34A diode; wrote 1949 article in Radio-Electronics magazine on how to "Build a Transistor"

Perry Williams, W1UED (SK) - Long time ARRL Washington Coordinator and League archivist; convinced Congress to approve vanity call sign program and not to impose a license application fee on amateurs; persuaded FCC to retain large amateur microwave allocations and to create primary amateur allocation at 2.4 GHz

CQ DX and Contest and DX Halls of Fame

The CQ DX and Contest Halls of Fame honour those amateurs who not only excel in personal performance in these major areas of amateur radio but who also "give back" to the hobby in outstanding ways. The 2016 inductees are:

Nigel Jolly, KC3HAE, and the Crew of the RV Braveheart - Nigel and his crew (and ship) have provided transportation for - and assured the safety of - many of the major DXpeditions to southern islands in the past 15 years, DXpeditions that likely would not otherwise have taken place.

Roger Balister, G3KMA - As manager of the Islands on the Air programme since 1985, Roger has seen IOTA grow from a few hundred early participants to more than 10 000 today, making it one of the most popular award programs in amateur radio.

The 2016 inductees to the CQ Contest Hall of Fame are:

Tod Olson, KOTO - Tod is the founding editor of the National Contest Journal and has served the general amateur radio community as an ARRL Section Manager, Vice Director, Division Director and International Affairs Vice President

Richard Strand, KL7RA (SK) - A radio astronomer taking advantage of the quiet of the northern latitudes for his research, Rich Strand built and maintained highly competitive contest stations in a very difficult environment and was, for many hams, their first (or only) CQ Zone 1 contact.

Formal inductions to the CQ Contest and DX Halls of Fame were conducted in conjunction with the Dayton Hamvention® in May. Contest Hall of Fame presentations were made at the Dayton Contest Dinner by CQ World Wide DX Contest Director Randy Thompson, K5ZD; DX Hall of Fame inductions were conducted at the Dayton DX Dinner on our behalf by noted DXers and CQ DX Hall of Fame members Bob Allphin, K4UEE, and Ralph Fedor, KOIR. Our thanks to all and congratulations to the inductees!

## African DX

Africa DX Net - every Saturday afternoon from 14:00 UTC on 14,260 MHz hosted by Mike, V51MA, Leon, A25SL, and Tinus, ZS6MHK.

Tunisia, 3V. Ash, KF5EYY, will be active as 3V8SS as a Single Op/All Band/Low Power entry in the CQ World Wide WPX CW contest. QSL via LX1NO.

Morocco, CN. A group of operators will be active as CN2AA as a Multi/Single entry in the CQ World Wide WPX CW contest. QSL via UA2FM.

## African Islands

IOTA frequencies

CW: 28 040 24 920 21 040 18 098 14 040 10 114 7 030 3 530 kHz

SSB: 28 560 28 460 24 950 21 260 18 128 14 260 7 055 3 760 kHz



Canary Islands, EG8. Juan, EA8RM, will be active as EG8RM from Magic Mountain on Gran Canaria Island (AF-004) during the CQ WW WPX CW Contest (28 and 29 May) as a Single-Op/All-Band/Low-Power entry. QSL via LoTW.

Cape Verde, D4. Girts, YL2KL will be active as D41CV in the CQ World Wide WPX CW contest to celebrate the 41st anniversary of the independence of the Cape Verde Islands. QSL via the operator's instructions.

## Contest Calendar

This week's contests as compiled by Bruce Horn, WA7BNM. The period covered is 23 to 30 May 2016

### SKCC Sprint

00:00 - 02:00 UTC 25 May

Mode: CW

Bands: 160, 80, 40, 20, 15, 10 m

Classes: (none)

Exchange: RST, state, province or country, name and SKCC no or power

Work stations: Once per band

QSO Points: 1 point per QSO; Bonus Points: 5 points per Centurion member QSO per band; 10 points per Tribune member QSO per band; 25 points per QSO with SKCC club call (K9SKC) per band

Multipliers: Each state, province or country once

Score Calculation: Total score = (total QSO points x total mults) and bonus points

Submit logs by: 23:59 UTC 27 May 2016

E-mail log summary to: (none)

Post log summary at:

[http://www.skccgroup.com/operating\\_activities/weekday\\_sprint/submit-display.php](http://www.skccgroup.com/operating_activities/weekday_sprint/submit-display.php)

Mail logs to: (none)

Find rules at:

[http://www.skccgroup.com/operating\\_activities/weekday\\_sprint/](http://www.skccgroup.com/operating_activities/weekday_sprint/)

### Phone Fray

20:30 - 03:00 UTC 25 May

Mode: SSB

Bands: 160, 80, 40, 20, 15 m

Classes: Single Op

Max power: 100 watts

Exchange: NA: Name and state, province or country; non-NA: Name

Work stations: Once per band

QSO Points: NA station: 1 point per QSO; non-NA station: 1 point per QSO with an NA station

Multipliers: Each US state (including KH6/KL7) once per band; Each VE prov-

ince/territory once per band; Each North American country (except W/VE) once per band

Score Calculation: Total score = total QSO points x total mults

Submit logs by: 03:00 UTC 27 May 2016

E-mail logs to: (none)

Post log summary at:

<http://www.3830scores.com>

Mail logs to: (none)

Find rules at:

[http://www.perluma.com/Phone\\_Fray\\_Contest\\_Rules.pdf](http://www.perluma.com/Phone_Fray_Contest_Rules.pdf)

Score Calculation: Total score = total QSO points

Submit logs by: 10 June 2016

E-mail logs to: [lrsf@lrsf.lt](mailto:lrsf@lrsf.lt)

Mail logs to: Baltic Contest, PO Box 210, LT-44003 Kaunas, Lithuania

Find rules at:

[http://www.lrsf.lt/bcontest/english/rules\\_html.htm](http://www.lrsf.lt/bcontest/english/rules_html.htm)

### CWops Mini-CWT Test

13:00 - 14:00 UTC and 19:00 - 20:00 UTC 25 May and 03:00 - 04:00 UTC 26 May

Mode: CW

Bands: 160, 80, 40, 20, 15, 10 m

Classes: Single Op - QRP, low or high

Max power: HP: >100 watts; LP: 100 watts;

QRP: 5 watts

Exchange: Member: Name and member no; non-Member: Name and state, province or country

Work stations: Once per band

QSO Points: 1 point per QSO

Multipliers: Each call once

Score Calculation: Total score = total QSO points x total mults

Submit logs by: 04:00 UTC May 28, 2016



Post log summary at:

<http://www.3830scores.com>

Mail logs to: (none)

Find rules at:

<http://www.cwops.org/cwt.html>

NCCC RTTY Sprint

01:45 - 02:15 UTC 27 May

Mode: RTTY

Bands: (see rules)

Classes: (none)

Exchange: Serial no, name and QTH

Score Calculation: Total score = total QSO points x total mults

Submit logs by: 29 May 2016

E-mail logs to: (none)

Post log summary at:

<http://www.3830scores.com/>

Mail logs to: (none)

Find rules at:

<http://www.ncccsprint.com/rtty.html>

NCCC Sprint

20:30 - 03:00 UTC 27 May

Mode: CW

Bands: (see rules)

Classes: (none)

Exchange: Serial no, name and QTH

Score Calculation: Total score = total QSO points x total mults

Submit logs by: 29 May 2016

E-mail logs to: (none)

Post log summary at:

<http://www.3830scores.com/>

Mail logs to: (none)

Find rules at:

<http://www.ncccsprint.com/rules.html>

CQ WW WPX Contest, CW

00:00 UTC 28 May to 23:59 UTC 29 May

Mode: CW

Bands: 160, 80, 40, 20, 15, 10 m

Classes: Single Op All Band - QRP, low or high - tribander or rookie; Single Op Single Band - QRP, low or high - tribander or rookie; Single Op Assisted All Band - QRP, low or high - tribander or rookie; Single Op Assisted Single Band - QRP, low or high - tribander or rookie

Multi-Single - low or high; Multi-Two; Multi-Multi

Max operating hours: Single Op: 36 hours with off times of at least 60 minutes; Multi-Op: 48 hours

Max power: HP: 1 500 watts; LP: 100 watts;

QRP: 5 watts

Exchange: RST and serial no

Work stations: Once per band

QSO Points: 6 points per 160, 80 and 40 m

QSO with different continent; 3 points per

20, 15 and 10 m QSO with different conti-

nent; 2 points per 160, 80 and 40 m QSO

with same continent different country; 1

point per 20, 15 and 10 m QSO with same

continent different country; 4 points per

160, 80 and 40 m QSO between stations in

NA; 2 points per 20, 15 and 10 m QSO be-

tween stations in NA; 1 point per QSO with same country

Multipliers: Prefixes once

Score Calculation: Total score = total QSO points x total mults

Submit logs by: 3 June 2016

E-mail logs to: [cw@cqwp.com](mailto:cw@cqwp.com)

Upload log at:

<http://www.cqwp.com/logcheck/>

Mail logs to: CW WPX Contest, PO Box 481, New Carlisle, OH 45344, USA

Find rules at:

<http://www.cqwp.com/rules.htm>

Portuguese Navy Day Contest, Digital

08:00 - 23:59 UTC 28 May

Mode: Digital

Bands: 80, 40, 20, 15, 10 m

Classes: Single Op

Exchange: NRA Club: Member no and CQ

Zone; non-member: QSO no and CQ Zone

Work stations: Once per band

QSO Points: See rules

Multipliers: Each country once per band

Score Calculation: Total score = total QSO points x total mults

Submit logs by: 17 June 2016

E-mail logs to: [nra@nra.pt](mailto:nra@nra.pt)

Mail logs to: (none)

Find rules at: <http://www.nra.pt/portuguese-navy-day-contest---2016.html>

SARL Digital Contest  
13:00 - 16:00 UTC 29 May  
Mode: PSK, RTTY  
Bands: 80, 40, 20 m  
Classes: (none)  
Exchange: RST and QSO no  
Work stations: Once per mode per band  
QSO Points: (see rules)  
Multipliers: (see rules)

Score Calculation: Total score = total QSO  
points x total mults  
Submit logs by: 5 June 2016  
E-mail logs to: [contest@sarl.org.za](mailto:contest@sarl.org.za)  
Mail logs to: (none)  
Find rules at:  
<http://www.sarl.org.za/Web3/Members/DoD>  
[ocDown-](#)  
[load.aspx?X=20151130131559djqp8afPgb.PD](#)  
[F](#)

## Next Week's Contests

Phone Fray, 20:30 - 03:00 UTC 1 June  
CWops Mini-CWT Test, 13:00 - 14:00 UTC and 19:00 - 20:00 UTC 1 June and 03:00 - 04:00 UTC 2 June  
NRAU 10 m Activity Contest, 17:00 - 18:00 UTC (CW), 18:00 - 19:00 UTC (SSB), 19:00 - 20:00 UTC (FM) and 20:00 - 21:00 UTC (Dig) 2 June  
NCCC RTTY Sprint, 01:45 - 02:15 UTC 3 June  
NCCC Sprint, 20:30 - 03:00 UTC 3 June  
HA3NS Sprint Memorial Contest, 19:00 - 19:29 UTC (40 m) and 19:30 - 19:59 UTC 3 June (80 m)  
10-10 International Open Season PSK Contest, 00:00 UTC 4 June to 24:00 UTC 5 June  
PVRC Reunion, 00:00 - 04:00 UTC 4 June (CW) and 00:00 - 04:00 UTC 5 June (SSB)  
DigiFest, 04:00 - 12:00 UTC and 20:00 UTC 4 June to 04:00 UTC 5 June and 12:00 - 20:00 UTC 5 June  
Wake-Up! QRP Sprint, 06:00 - 06:29 UTC, 06:30 - 06:59 UTC, 07:00 - 07:29 UTC and 07:30 - 08:00 UTC 4 June  
SEANET Contest, 12:00 UTC 6 June to 12:00 UTC 7 June  
UKSMG Summer Contest, 13:00 UTC 4 June to 13:00 UTC 5 June  
Dutch Kingdom Contest, 15:00 UTC 4 June to 15:00 UTC 5 June  
IARU Region 1 Field Day, CW, 15:00 UTC 4 June to 14:59 UTC 5 June  
RSGB National Field Day, 15:00 UTC 4 June to 15:00 UTC 5 June  
Alabama QSO Party, 16:00 UTC 4 June to 04:00 UTC 5 June  
RSGB 80 m Club Championship, Data, 19:00 - 20:30 UTC 6 June  
ARS Spartan Sprint, 01:00 - 03:00 UTC 7 June

# VHF Happenings

## Transatlantic Tests on 144 MHz

Marcos Turbo, PY1MHZ, at Rio de Janeiro reports that he will be on vacation in August for 30 days and in January for 30 days more. He will make transatlantic attempts near the sea from GG98ma and is working on a new rope Yagi antenna. He is currently monitoring the V51VHF beacon as well as Pieter, V51PJ, on 144 MHz JT65b using 2 x 12 LFA Yagis. Marcos is also running a beacon from his home QTH in Rio de Janeiro, GG98ic - PY1ESP/b on 144,290 MHz CW and horizontally polarized. Keep a lookout for it.

## If you are stuck with a vertical antenna then add a horizontal loop

Many amateurs who are townhouse dwellers are often restricted to a vertical antenna on 144 MHz and limited to repeater and mobile operation. RCA has proven many years ago that horizontal VHF radio waves travel much further and with less loss over the curvature of the Earth than vertical waves. Therefore, if you could mount a small loop antenna at the bottom of your vertical then you could really extend the range of your 2 metre activity and make the best of both polarizations.

All the long distance ZR/ZS stations including the VHF DX are all horizontally polarized and located at the bottom end of the 144 MHz band as well as all the beacons. A small loop antenna with a diameter of about 30 centimetres and fed with a gamma match could be mounted on the side of your metal mast. Alternatively, if your vertical is mounted on a length of PVC pipe above a metal mast then the loop can be located around this pipe and will look less conspicuous. Full details of VHF loop antennas are available on the Internet or Amateur Radio Handbooks. You could stack two loop antennas above each other and realize a gain of 3 dBd or 5,15 dBi in all directions on 144 MHz.

## Search Continues for STMSat-1 Radio Signal

Youngsters at St Thomas More Cathedral School in Virginia remain optimistic that their STMSat-1 CubeSat <http://www.stmsat-1.org/rmoc/>, deployed on 16 May from the International Space Station (ISS), will begin transmitting a signal. Helping in the search is the Space Science Centre at Morehead State University in Kentucky, which is using its 21 metre dish to scan multiple frequencies for the spacecraft's signal. STMSat-1 is supposed to transmit on 437,800 MHz FM and transmit slow-scan television (SSTV) pictures back to Earth.

*The 21 metre dish at Morehead State University in Kentucky has been helping in the search for STMSat-1's signal.*



"Morehead University picked up something within our frequency range last night," STMSat-1 Education Manager Emily Stocker said 25 May in response to an ARRL inquiry. "It may have been us; it is possible it was MinXSS." The University of Colorado's MinXSS deployed from the ISS at the same time as STMSat-1. Stocker said they were trying to determine if Morehead State picked up a beacon, which probably would suggest a MinXSS signal or SSTV data, which would likely confirm a signal from STMSat-1. In addition, JA0CAW posted a tweet reporting a signal heard on 437,800 MHz at 12:25 UTC on 25 May.

The school thanked students at Morehead State for staying up all night listening in the 437 MHz range. Their next step is to install SSTV software to see if they can decode a signal.

The CubeSat was rebooted from the ground just after 04:00 UTC on 24 May. The reboot was scheduled after the satellite had not been heard from for 7 days. STMSat-1 was supposed to turn itself on once its batteries were fully charged and its mechanized antennas deployed.

Pupils at the school built STMSat-1 during a 4-year-long project, and the satellite was launched to the ISS last December. After being placed in orbit (it is [object 41476](#)), the CubeSat initially continued roughly in the same orbit as the ISS and of other satellites deployed



on 16 May, but it has been moving away a little bit each day. The youngsters have been tracking its orbit.

The satellite is designed to transmit slow-scan television (SSTV) images (Robot 72) of Earth on 437,800 MHz FM. Stocker advised all those interested to follow the STMSat-1 [Twitter](#)



[feed](#), @STMSat11, to stay up to date.

The satellite is the first to be designed and built by grade schoolers, who were supported by NASA technical advisors and local radio amateurs. NASA's Technology Demonstration Office provided the school with a mobile "clean room" for the construction, and a ground-station antenna. The agency has been advising the school on tracking the satellite and finding its signal.

*Pupils at St Thomas More Cathedral School in Arlington, Virginia, assembled STMSat-1 in a NASA-provided "clean room." [St Thomas More Cathedral School photo]*

Items used with acknowledgement to the ARRL Letter, the ARRL DX News, the ARRL Contest Update, OPDX Bulletin, 425 DX Bulletin, DXNL Newsletter, WIA-News, the RSGB News, DxCoffee, Southgate ARC News, DX World and the Amateur Radio Newsletter